

Overview:

In this lesson, students explore behavior adaptations that benefit survival and/or reproductive success in an Alaskan animal. Students will conduct a take-home activity to observe a selected animal for a set of behaviors to gain a deeper understanding of animal behaviors.

Objectives:

The student will:

- describe two animal behaviors that lead to increased survival or reproductive success; and
- quantify animal behaviors in a field setting

Targeted Alaska Grade Level Expectations:**Science**

[11] SC2.2 The student demonstrates an understanding of the structure, function, behavior, development, life cycles, and diversity of living organisms by describing the learned behaviors (e.g., classical conditioning, imprinting, trial and error) that are utilized by living organisms to meet the requirements of life.

Vocabulary:

behavior – the way in which an animal responds to stimuli in their environment

classical conditioning – a learning method by which a subject comes to respond in a desired manner to a previously neutral stimulus that has been repeatedly presented along with an unconditioned stimulus that elicits the desired response

ethology – the study of animal behavior in their natural habitat

fixed-action patterns – a sequence of unlearned behaviors that are triggered by an external stimuli

habituation – a simple form of learning in which an animal, after a period of exposure to a stimulus, stops responding

imprinting – an innate and learned behavior in which a newborn or very young animal establishes a behavior pattern of recognition and attraction to another animal of its own kind or to a substitute identified as the parent

innate behavior – behaviors that have a strong genetic influence in which nearly all individuals of a population exhibit the same behavior regardless of external variables

learned behavior – modification of behavior based on specific experiences of the individual

migration – a regular movement of all or part of an animal population to and from a given location

operant conditioning – a learning method of reaching a correct solution or satisfactory result by trying out various means or theories until error is sufficiently reduced or eliminated

Whole Picture:

Humans have observed animal behavior for tens of thousands of years. Careful observation of animal behaviors often means the difference between success or failure when hunting or fishing.

Behavior is the way in which an animal responds to stimuli in its environment. It may be visible as a muscular movement that result in a birdcall or in the raised fins of a fish guarding its territory. Conversely behavior may be non-visible such as when an animal secretes pheromones to attract a mate.

Behavioral ecology is the study of how behavior develops, is controlled and how it contributes to survive and reproductive success of the animal. Ethology is a sub-discipline that focuses on how animals behave in their natural environment.

Many animal behaviors have a strong genetic component creating a complex interaction with the environment. Biologists study how both genes and environment influence animal behavior.

Materials:

- Six-sided die (one per student)
- Computers with Internet access (one per student)
- Pencil or pen (one per student)
- Balloon (one)
- RESEARCH SITE: "Alaska Department of Fish and Game: Animals" (<http://www.adfg.alaska.gov/index.cfm?adfg=animals.main>)
- STUDENT WORKSHEET: "Alaska Animal Behavior"
- STUDENT WORKSHEET: "Animal Behavior Observation"

Activity Preparation:

Inflate a balloon and place it in the classroom where students will not see it but where you will have access.

Pre-Assessment*Quick Write*

- Write on the board: "What behaviors help animals survive? What behaviors do you notice when watching animals?"
- Ask students to brainstorm for three minutes. Students should write down every idea that comes to mind. In the last two minutes of the activity, ask students use their brainstorm ideas to answer the questions in two complete sentences.
- Ask students share their ideas with their shoulder partner. Have one partner from each pair come to the board and write down one answer to either question.
- Review student ideas as a whole class. Be sure to define behavior and give examples how behavior is influenced by the interaction between genes and the environment.

Activity Procedure:

1. Without students noticing what you are doing, pop a balloon. Students should exhibit a startle response.
2. Ask students to identify behaviors that were the result of the loud popping sound. Write observation on the board. As you write, note that some behaviors, such as blinking to a startling sound, are reflex while other behaviors, such as laughing or asking 'What was that?', are learned behavior.
3. Ask students what would happen if a balloon popped every minute during class or if you gave a warning before you popped the balloon? If students do not suggest it tell students that they would likely become habituated to the sound of the popping balloon and many of their previous behaviors to the popping balloon would decrease or stop altogether.
4. Review animal behaviors with your students making sure to reinforce that genes and the environment interact to produce behaviors.
5. Hand out all the supplies needed for the student worksheet. Allow students to work on the worksheet and help the students when needed. Students will use the Alaska Department of Fish and Game website but can also research animals on other sites.
6. After students complete their animal research, review the concepts of both learned and innate behaviors.
7. Hand out and review STUDENT WORKSHEET: "Animal Behavior Observation" and instruct students that after school they will choose on animal and observe it for specific behaviors once every five minutes for at least 30 minutes. The animal may be either a pet or wild animal, but the student should attempt to remain unnoticed by the animal during the observation time.

NOTE: If students hunt or fish this would offer a good opportunity for animal behavior observations of either game or non-game animals in the environment. Depending on the season or other circumstances this observation assignment might take more than one day for students to complete and could be assigned on a Friday for completion by the following Monday.

8. When students return with animal observation data have them share their findings with the class. Discuss with the class the challenge of only observing an animal for 30 minutes and point out that some ethologists spend months or years in the field observing their study animals.

Additional Resources:

1. View video lectures by Robert Sapolsky from Stanford University about human behavioral biology: <http://blogs.plos.org/neuroanthropology/2011/04/10/robert-sapolsky-and-human-behavioral-biology/>.
2. View American Humane Society resources regarding animal behavior focused on domesticated pets: <http://abrionline.org/>.
3. The Association for the Study of Animal Behavior is a scientific journal focused on animal behavior: <http://www.sciencedirect.com/science/journal/00033472>.

NAME: _____
ALASKA ANIMAL BEHAVIOR

Materials: One die, pencil/pen, and a computer with Internet access.

1. Roll the die to determine the type of animal you will research. (Circle one)

1-2 (Mammal)

3-4 (Bird)

5 (Fish)

6 (Invertebrate)

2. Roll again to determine the name of the animal you will research. The first letter of the animal's common name starts with the following letter. (Circle one)

1-2 (A to H)

3-4 (I to P)

5-6 (Q to Z)

3. Using a computer with Internet access navigate to the Alaska Fish and Game webpage: <http://www.adfg.alaska.gov/index.cfm?adfg=animals.main>.

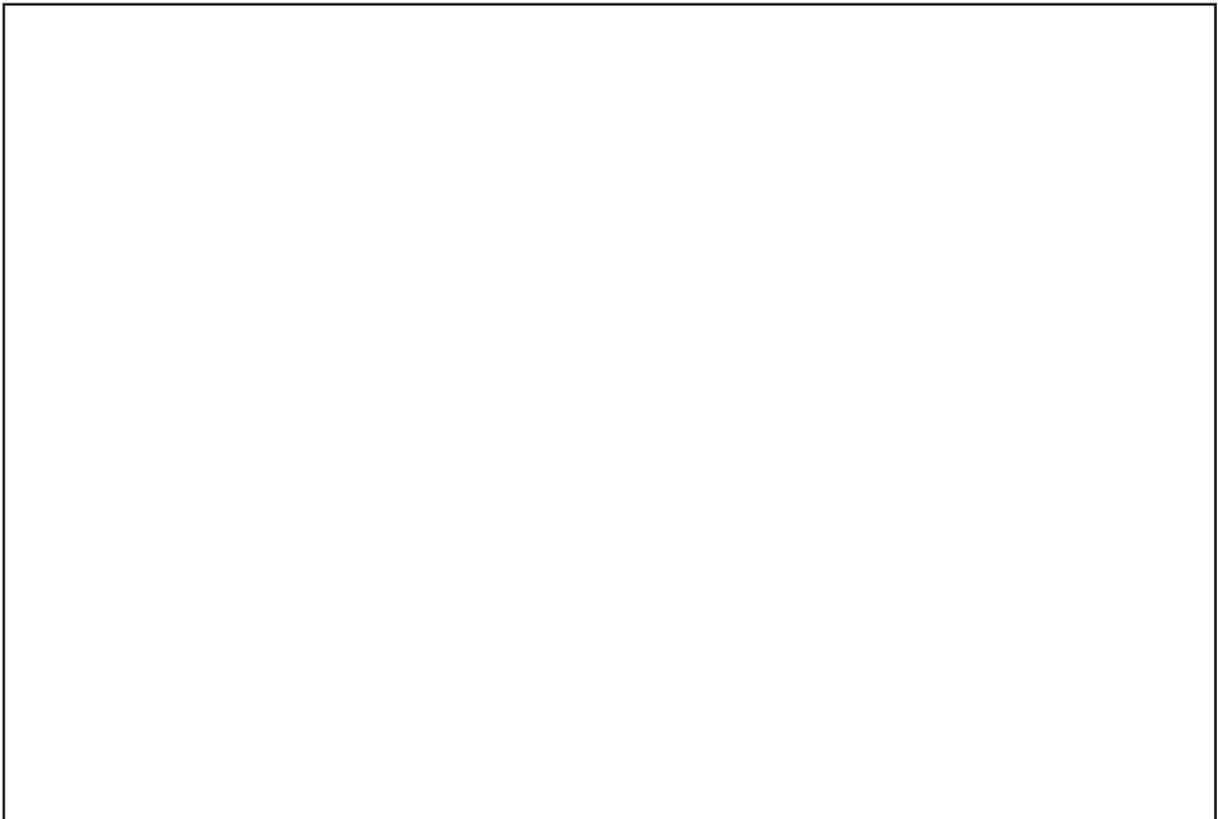
Choose an animal that fits your criteria.

Common name: _____

Scientific name: _____

Where in Alaska is your animal found? _____

Briefly sketch your animal below:



NAME: _____
ALASKA ANIMAL BEHAVIOR

STUDENT WORKSHEET
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4. In one or two sentences describe the behavior of your animal. _____

NOTE: You will likely need to conduct additional research to complete the following questions.

5. Briefly explain how this behavior increases the animal's chance at survival or reproduction.

6. In one or two sentences describe another behavior of your animal.

7. Explain how this behavior increases the animal's chance at survival or reproduction.

NAME: _____

ANIMAL BEHAVIOR OBSERVATION

Date of Observation: _____

Observer's Name: _____

Start Time: _____

Animal Name or Description: _____

Stop Time: _____

Habitat Description: _____

Directions: In the time column write the time of your observation. The first two categories "Eating or Foraging" and "Sleeping" are filled in for you. Choose four other behaviors you want to observe and write them in the "Your Category" boxes. Observe your study animal for 10 seconds every 5 minutes for at least 30 minutes. Record the number of times the animal does each behavior

Time	Eating or Foraging	Sleeping	Your Category	Your Category	Your Category	Your Category

Questions:

1. What was the most common behavior during the observation time? _____

2. Briefly explain how this behavior increases the animal's chance at survival or reproduction.

3. Did you observe any learned behaviors in your study animal? If so, briefly describe them. _____

4. Describe any surprising or interesting behaviors your observed in your study animal. _____

